

## CLAIMS

I/We claim:

- [c1] 1. A power supply with a feed forward circuit, said power supply comprising:
- a power supply comprising:
  - a transformer comprising a primary winding and a secondary winding, wherein said transformer transforming an input voltage to an output voltage and a turns ratio of said primary winding and secondary winding changing according to a switch signal;
  - a switch receiving said switch signal to proceed a switch operation;
  - a rectifier circuit connecting to said secondary winding and rectifying said output voltage;
  - a switch signal generator generating said switch signal; and
  - a feed forward circuit directly receiving said switch signal to transmit a feed forward signal to a feedback circuit to restrain a peak voltage of said output voltage resulted from said turns ratio changing.
- [c2] 2. The power supply in claim 1, said secondary winding comprises:
- a first secondary winding; and
  - a second secondary winding,
- wherein when said switch not receiving said switch signal, said turns ratio of said transformer being a ratio of turns of said primary winding and turns of said first secondary winding; and when said switch receiving said switch signal, said turns ratio of said transformer being a ratio of the turns of said primary winding and turns of said first secondary winding plus said second secondary winding.

- [c3]            3.     The power supply in claim 2, said rectifier circuit comprises a first rectifier and a second rectifier, wherein when said switch not receiving said switch signal, said first rectifier rectifying said output voltage; when said switch receiving said switch signal, said second rectifier rectifying said output voltage.
- [c4]            4.     The power supply in claim 3, said first rectifier and said second rectifier are diode rectifiers.
- [c5]            5.     The power supply in claim 1, said switch is MOSFET.
- [c6]            6.     The power supply in claim 1, said feed forward circuit is a differentiator.
- [c7]            7.     The power supply in claim 6, said differentiator comprises a capacitor, two diodes, and two resistances.
- [c8]            8.     The power supply in claim 6, said differentiator comprises a capacitor and a resistance.
- [c9]            9.     The power supply in claim 1, said switch signal generator generates said switch signal when an input voltage of said switch signal generator is lower than a predetermined voltage.
- [c10]           10.    A power supply with a feed forward circuit, said power supply comprising:  
                a bulk capacitor filtering noises in said DC voltage;  
                a DC/DC converter transferring a voltage across said bulk capacitor to a  
                        first output voltage;  
                a power supply comprising:

a transformer comprising a primary winding and a secondary winding, wherein said transformer transforming said first output voltage to a second output voltage and a turns ratio of said primary winding and secondary winding changing according to a switch signal;  
a switch receiving said switch signal to proceed a switch operation;  
a rectifier circuit connecting to said secondary winding and rectifying said output voltage;  
a switch signal generator generating said switch signal; and  
a feed forward circuit directly receiving said switch signal to transmit a feed forward signal to a feedback circuit to restrain a peak voltage of said second output voltage resulted from said turns ratio changing.

[c11] 11. The power supply in claim 10, said secondary winding comprises:  
a first secondary winding; and  
a second secondary winding,  
wherein when said switch not receiving said switch signal, said turns ratio of said transformer being a ratio of turns of said primary winding and turns of said first secondary winding; and when said switch receiving said switch signal, said turns ratio of said transformer being a ratio of the turns of said primary winding and turns of said first secondary winding plus said second secondary winding.

[c12] 12. The power supply in claim 11, said rectifier circuit comprises a first rectifier and a second rectifier, wherein when said switch not receiving said switch signal, said first rectifier rectifying said second output voltage; when said switch receiving said switch signal, said second rectifier rectifying said second output voltage.

[c13] 13. The power supply in claim 10, said feed forward circuit is a differentiator.

[c14] 14. The power supply in claim 13, said differentiator comprises a capacitor, two diodes, and two resistances.

[c15] 15. The power supply in claim 13, said differentiator comprises a capacitor and a resistance.

[c16] 16. The power supply in claim 10, said switch signal generator generating said switch signal when said voltage across said bulk capacitor is lower than a predetermined voltage.

[c17] 17. A method for restraining a switching peak voltage of a power supply with a feed forward circuit, said method comprising:

providing a power supply, said power supply comprising:

a transformer comprising a primary winding and a secondary winding, wherein said transformer transforming a input voltage to a output voltage and a turns ratio of said primary winding and secondary winding changing according to a switch signal;

a switch receiving said switch signal to proceed a switch operation;

a rectifier circuit connecting to said secondary winding and rectifying said output voltage;

providing a switch signal generator, said switch signal generator generating said switch signal; and

providing a feed forward circuit, said feed forward circuit directly receiving said switch signal to transmitting a feed forward signal to a feedback circuit to restrain a peak voltage of said output voltage resulted from said turns ratio changing.

[c18] 18. The method in claim 17, said secondary winding comprises:

a first secondary winding; and

a second secondary winding,

wherein when said switch not receiving said switch signal, said turns ratio of said transformer being a ratio of turns of said primary winding and turns of said first secondary winding; and when said switch receiving said switch signal, said turns ratio of said transformer being a ratio of the turns of said primary winding and turns of said first secondary winding plus said second secondary winding.

[c19] 19. The method in claim 18, said rectifier circuit comprises a first rectifier and a second rectifier, wherein when said switch not receiving said switch signal, said first rectifier rectifying said output voltage; when said switch receiving said switch signal, said second rectifier rectifying said output voltage.

[c20] 20. The method in claim 19, said first rectifier and said second rectifier are diode rectifiers.